

## AREA Forum

# ARE TREE INVENTORIES ESSENTIAL TOOLS FOR THE MANAGEMENT OF CITY TREES?

Tree inventories were frequently used in the 1970s, but now interest seems to have decreased. Papers describing inventories are not published or presented at conferences as often as they were earlier. Municipalities and institutions in charge of city tree management seem to have found other methods to manage their trees.

In this Forum, Robert Miller, Richard Abbott, and Thomas Randrup express their thoughts about tree inventories. If you would like to participate in the Forum, please send your suggestions to the Journal Editor or to me at [ach@hp9000a1.uam.mx](mailto:ach@hp9000a1.uam.mx) or [ach@hp.fciencias.unam.mx](mailto:ach@hp.fciencias.unam.mx).

Alicia Chacalo  
AREA Past President

Robert Miller  
Professor of Urban Forestry  
University of Wisconsin–Stevens Point  
[rmiller@uwsp.edu](mailto:rmiller@uwsp.edu)

A great deal of inventory work was done in the early 1970s, but the systems used were very complicated, ran on mainframe computers, and often did not meet expectations of the users. The next generation ran on desktop computers, and current systems operate primarily in the Windows environment and are increasingly being used by managers.

Inventories of urban trees and forests can take a variety of forms, but all too often we immediately think of computer-based systems for street trees. While a computer-based system can be an important tool, we can inventory urban trees and forests in a variety of other ways. Management is the key to thinking about inventories. What do you need to know to effectively manage your trees? How will you use this information both politically and practically? Will the inventory allow you to do your job more effectively? Too many inventories have been collected and not effectively used because management needs were not considered when selecting the system. Inventories can be expensive, so be sure the information justifies the expense.

Information describing the urban forest can be gathered in a variety of ways, with a great range in cost and information collected. An inexpensive snapshot can be readily obtained using air photos for a tree-canopy analysis. The community is stratified by apparent tree cover and land use, and a dot grid is used to determine the percentage of canopy cover for each stratum. Canopy analysis does not distinguish between public and private trees and does not tell you anything about tree condition, but it will tell you where good tree cover exists and where tree planting may be needed. Canopy analysis is a good first step in developing a management program and convincing public officials of the need for a program.

Tree tallies are also inexpensive and can tell you a lot about your public tree population. Tally sheets are prepared with species inventoried by diameter class, and condition, and the tally sheets have categories for vacant spaces and hazards. Tallies made while walking or driving along streets provide a wealth of information about community public tree assets when summarized for the number of street trees, vacant planting sites, species diversity, frequency by diameter class and general condition of the tree population. However, tallies do not tell you anything about individual trees at individual locations. Some cities use tallies by work or management units to schedule maintenance and to develop master street tree plans.

Communities with a large number of trees—but little funding for inventories—can use sampling as a means to collect tree information. Sampling provides information similar to tallies but like tallies cannot provide information on individual trees at specific locations.

Computer-based systems allow you to collect information about individual trees at specific locations, keep records, generate work orders, and summarize data in a variety of formats. However, these systems are expensive to start up and to maintain. Before deciding on a computer-based system, analyze your current level of tree management, decide what you need

to know to better manage your trees, and then select a system to meet these needs. Also be sure your hardware will drive the software you select. Gene Olig and I wrote a Guide to Street Tree Inventory Software for the U.S. Forest Service. The guide is available on the Web (<http://willow.ncfes.umn.edu/pubs/urbanforestry/streettree/toc.htm>).

Much is said these days about using a GIS for tree inventories. A GIS can work well as the basis for a tree inventory, but only if a system is already in place for other community features such as streets and utilities. Initiating a GIS is very expensive and you will not likely be able to justify putting a community on a GIS to generate tree maps.

Richard E. Abbott  
CEO  
ACRT, Inc.  
[reabbott@acrinc.com](mailto:reabbott@acrinc.com)

Answering the above question is like a municipality trying to repair streets and plow snow without knowing how many miles of streets they have or where the streets are located.

I strongly disagree with the statement, "Tree inventories were frequently used in the 1970s, but now interest seems to have decreased." I have been commercially marketing, selling, and performing street tree inventories since 1978 throughout North America. There is more interest in street tree inventories now than at any time. Not only are municipalities inventorying trees along the streets and in their parks, but electric utilities have come to recognize the need for complete, accurate tree information to forecast workload needs, budgets, scheduling of crews, etc. Recently, ACRT completed a major project for an electric utility for which we inventoried and mapped 454,000 trees. We currently have 7 tree inventory projects in progress.

Recently, 2 municipalities and 1 resort were able to use the ISA shade tree values in their inventories. It was used to collect hundreds of thousands of dollars from their insurance carriers for hurricane or tornado damages. If those organizations did not have a complete, accurate, and comprehensive inventory, they could not have substantiated their urban forest loss in value. The Federal Emergency Management Agency requires an inventory of tree damages from major disasters as a basis for funding mitigation efforts.

There are different types of inventories depending on the use of that information, including

- windshield inventory—used extensively in the northeastern United States to assess damage from the 1998 ice storm.
- statistical sample inventory—used to determine the work needs and man-hours required at a 90% confidence level.
- complete inventory—used to completely and accurately record all the data, work needs, work history, and costs for each individual tree.

I expect and project that as more municipalities, electric utilities, and government agencies recognize the need for comprehensive tree data to proactively manage the tree resource, demand will increase for tree inventories.

Thomas B. Randrup  
Danish Forest Institute  
[tbr@fsl.dk](mailto:tbr@fsl.dk)

The above question could be rewritten as "How can anything be managed, if you do not know what you are managing?" It seems obvious that urban trees are listed, categorized, and monitored for the benefit of optimal management. A tree inventory gives an overview of the stock of trees in the city and thus is a planning tool with which urban trees can be maintained properly and in accordance with the resources available. However, it is well known that urban tree inventories are not as common as one would imagine. The reason might be that tree inventories are often regarded as time consuming to perform and expensive to maintain.

Urban tree inventories may be more complicated than any other inventory. Urban trees occur in a wide variety of species, sizes, and locations. Furthermore, a tree population will never be static. Trees grow and need to be maintained. Over the years, trees change from requiring one type of maintenance practice to another and eventually need to be removed. Even trees of the same species and seed origin require different maintenance techniques and routines, according to their location and purpose.

Many inventories were never completed or finished, or never used because the objectives and process were not clearly defined in the first place. As a result, no set traditions of inventorying urban trees

have been developed. However, a growing recognition of the values of urban trees in combination with higher demands for efficiency and quality to those who manage the trees has increased the general interest in urban tree inventories.

Highly developed tree inventory systems already exist. These include the use of handheld computers for data collection and GIS for data storage, and may involve GPS for the precise location of trees. The use of these technologies seems obvious but should not leave out the basics for carrying out any inventory: The need for the inventory. What is going to be achieved and what kind of information is needed?

A frequent problem has been to include too much information in the inventory. A few facts about every tree (e.g., location, species, size, condition range, and management needs) may be sufficient to develop a comprehensive management plan. In addition, information about growing conditions (e.g., growing space

type, size, and overhead conductors) may be sufficient to specify other maintenance needs, and with these data document species diversity, urban forest health, maintenance, and resource needs such as contracting.

Tree inventories are essential for optimal management but are often regarded in Denmark as an unnecessary luxury. This need not be the case. With the introduction of tree inventory software, and with careful consideration about the kind of information needed, most tree managers could conduct an inventory. Although inventories represent a significant investment, the information they provide can increase efficiency and reduce operating costs. Furthermore, developing a management plan based on these data can result in increased funding for the tree programs.

So, yes, tree inventories are essential tools for the management of urban trees.

## ISA NEWS & NOTES

---

Fourth International Symposium on the Tree  
The Fourth International Symposium on the Tree will be held August 20 to 26, 2000, on the grounds of the Montreal Botanical Garden, an inspiring site that should favor discussions and sharing of ideas. In keeping with tradition, the symposium will be organized according to the philosophy and themes established at the preceding symposiums, with sessions on functional and physiological anatomy, genetics as related to structure and development, dynamic processes, tree architecture, and development.

The official host of the meeting is Institut de recherche en biologie végétale, a research and training center established jointly by the Université de Montreal and the Montreal Botanical Garden. The objective of the meeting is to foster a global vision of the tree by bringing together complementary disciplines that usually work in isolation and to look at recent scientific developments and encourage interaction between the concepts and tools used in different fields of research.

Professionals from the many disciplines within the broad research fields of tree science will be in attendance. Many well-known scientists from around the globe have already confirmed their participation. The scientific committee is composed of the following scientists: Pierre-Yves Bernier, Québec City, Canada; André Bouchard, Montreal, Canada; Claude Édelin, Montpellier, France; Jean Galtier, Montpellier, France; Francis Hallé, Montpellier, France; Roelof A.A. Oldeman, Wageningen, the Netherlands; Catherine Potvin, Montreal, Canada; Przemyslaw Prusinkiewicz, Calgary, Canada; Melvin Tyree, Burlington, Vermont, U.S.; and Kamal Bawa, Boston, Massachusetts, U.S.

More information is available on the symposium Web site (<http://www.cliquer.com/jb/en/index.html>) or from Jacques Brisson, Institut de recherche en biologie végétale, Montreal, Québec, phone (514) 972-1437, email [brissoj@magellan.umontreal.ca](mailto:brissoj@magellan.umontreal.ca).

## BOOK REVIEW

---

A Survey of Urban Forestry in Britain. 1999. By Mark Johnston and Brian S. Rushton. 66 pp. Published by the University of Ulster. ISBN 1-85923-120-9. UK £8.50.

This publication reviews a survey questionnaire that was sent out to 187 local authorities (governments) in England, Wales, and Scotland. A parallel survey was conducted in the Republic of Ireland and was published in Proceedings of Ireland's Third National Conference on Urban Forestry. The methodology for both of these surveys was published in the *Arboricultural Journal* by Johnston and Rushton in 1998.

The aim of this study was to measure to what extent modern methods of urban tree management were being developed and practiced in Britain. The questionnaire and this report were divided into 4 sections with some general conclusions. The first section aimed to identify a number of variables that were mainly about the administrator responding, their local authorities (LAs), and the tree budget.

The second section identified the level of planned management that existed within the LAs and what it had in common with other forms of resource management. The authors feel that the principle of planned management is central to urban forestry. A wide range of indicators was used to measure for this, one of the most significant being the existence of a relevant strategy or planning document by the LAs.

Section three assessed the level of systematic tree and woodland management that was taking place

within the LAs. This section looked at the frequency of scheduled versus on-demand work and trends in maintenance work.

The last section was used to identify how much integrated management was taking place in the LAs, believing that integrated management is also central to the concept of urban forestry and that the interested organization and groups that have ownership of the urban environment need to be involved in the process. This section reviewed the interested parties and their relationship with the LAs.

The general conclusions pull the 4 sections together and review the structure and funding of urban tree management by the LAs in Britain. This publication concludes by looking to the future and trying to find a way to encourage the LAs to advance their standards in urban tree management. One suggestion is to establish in Britain a national program similar to Tree City USA.

This publication is a well-constructed document that contains a tremendous amount of information about trees and how the local governments in Britain are managing them. While it would be difficult to conduct such a study for all of North America, it could be used as a model at the state or province level. The methodology would allow for the convenient evaluation and comparison of urban forestry programming statewide and nationwide.

Reviewed by H. Dennis P. Ryan, University of Massachusetts, Amherst.

## ERRATUM

---

Bal Rao, one of the authors of "The Effect of Biobarrier® on Mycorrhizae in Oak and Sweetgum," on pages 92–96 of the *March Journal* was incorrectly listed as Bill Rao.